AMENDMENT TO THE CLAIMS

1. (Presently Presented) A method of optimizing an illumination profile of a pattern to be formed in a surface of a substrate, comprising the steps of:

defining a transmission cross coefficient ("TCC") function determined in accordance with an illumination pupil and a projection pupil corresponding to an illuminator;

representing at least one resolvable feature of a mask to be printed on the substrate by at least one impulse function; and

creating an interference map of a predetermined order based on the at least one impulse function and the TCC function, wherein the interference map represents the at least one resolvable feature to be printed on the substrate and areas of destructive interference.

2. (Presently Presented) The method of optimizing an illumination profile according to claim 1, placing an assist feature in the mask corresponding to the areas of destructive interference map.

3. (Presently Presented) The method of optimizing an illumination profile according to claim 2, wherein the assist feature is non-resolvable.

4. (Presently Presented) The method of optimizing an illumination profile according to claim 1, wherein the interference map models light intensity incident on the substrate.

5. (Presently Presented) The method of optimizing an illumination profile according to claim 4, further comprising placing at least one assist feature on an area of the mask corresponding to an area on the interference map having a light intensity of a predetermined level corresponding to the areas of destructive interference.

6. (Previously Presented) The method of optimizing an illumination profile according to claim 5, wherein the predetermined level corresponds to a resolvable light intensity.

7. (Presently Presented) The method of optimizing an illumination profile according to claim 1, wherein the interference map represents change in light intensity incident on the substrate.

8. (Withdrawn) A method of optimizing an illumination profile of a pattern of resolvable features to be formed in a surface of a substrate, the steps comprising of:

creating a Cartesian coordinate interference map, having at least two axes, in accordance with an impulse function representing the pattern of resolvable features to be formed in the substrate and a transmission cross coefficient function, the interference map representing the pattern of resolvable features to be formed and at least one area of interference, wherein the at least one area of interference is angled with respect to at least two axes having its origin at the center of the pattern to be formed and parallel with respect to the at least at least two axes of the interference map;

based on the map, placing an assist feature on an area of the mask corresponding to the at least one area of interference.

9. (Withdrawn) The method of optimizing an illumination profile according to claim 2, wherein the assist feature is non-resolvable.

10. (Presently Presented) A program product, comprising executable code transportable by at least one machine readable medium, wherein execution of the code by at least one programmable computer causes the at least one programmable computer to perform a

sequence of steps for optimizing an illumination profile of a pattern to be formed in a surface of a substrate, comprising:

defining a transmission cross coefficient ("TCC") function determined in accordance with an illumination pupil and a projection pupil corresponding to an illuminator;

representing at least one resolvable feature of a mask to be printed on the substrate by at least one impulse function; and

generating an interference map of a predetermined order based on the at least one impulse function and the TCC function, wherein the interference map represents the at least one resolvable feature to be printed on the substrate and areas of destructive interference.

11.   (Presently Presented) The program product according to claim 10, defining assist feature placement in the mask corresponding to the areas of destructive interference represented by the interference map.

12.   (Withdrawn) A method of imaging sub-wavelength contact holes, comprising the steps of:

defining a transmission cross coefficient ("TCC") function determined in accordance with an illumination pupil and a projection pupil corresponding to an illuminator;

representing at least one contact hole of a mask to be printed on a substrate by at least one impulse function; and

creating an interference map of a predetermined order based on the at least one impulse function and the TCC function, wherein the interference map represents the at least one contact hole to be printed on the substrate and areas of destructive interference.

13.   (Withdrawn) The method according to claim 12, placing an assist feature in the mask corresponding to the areas of destructive interference map.

14.   (Withdrawn) The method to claim 13, wherein the assist feature is non-resolvable.

15.   (Withdrawn) The method according to claim 12, wherein the interference map models light intensity incident on the substrate.

16.   (Withdrawn) The method according to claim 15, further comprising placing at least one assist feature on an area of the mask corresponding to an area on the interference map having a light intensity of a predetermined level corresponding to the areas of destructive interference.

17.   (Withdrawn) The method according to claim 15, wherein the predetermined level corresponds to a resolvable light intensity.

18.   (Withdrawn) The method according to claim 12, wherein the interference map represents change in light intensity incident on the substrate.